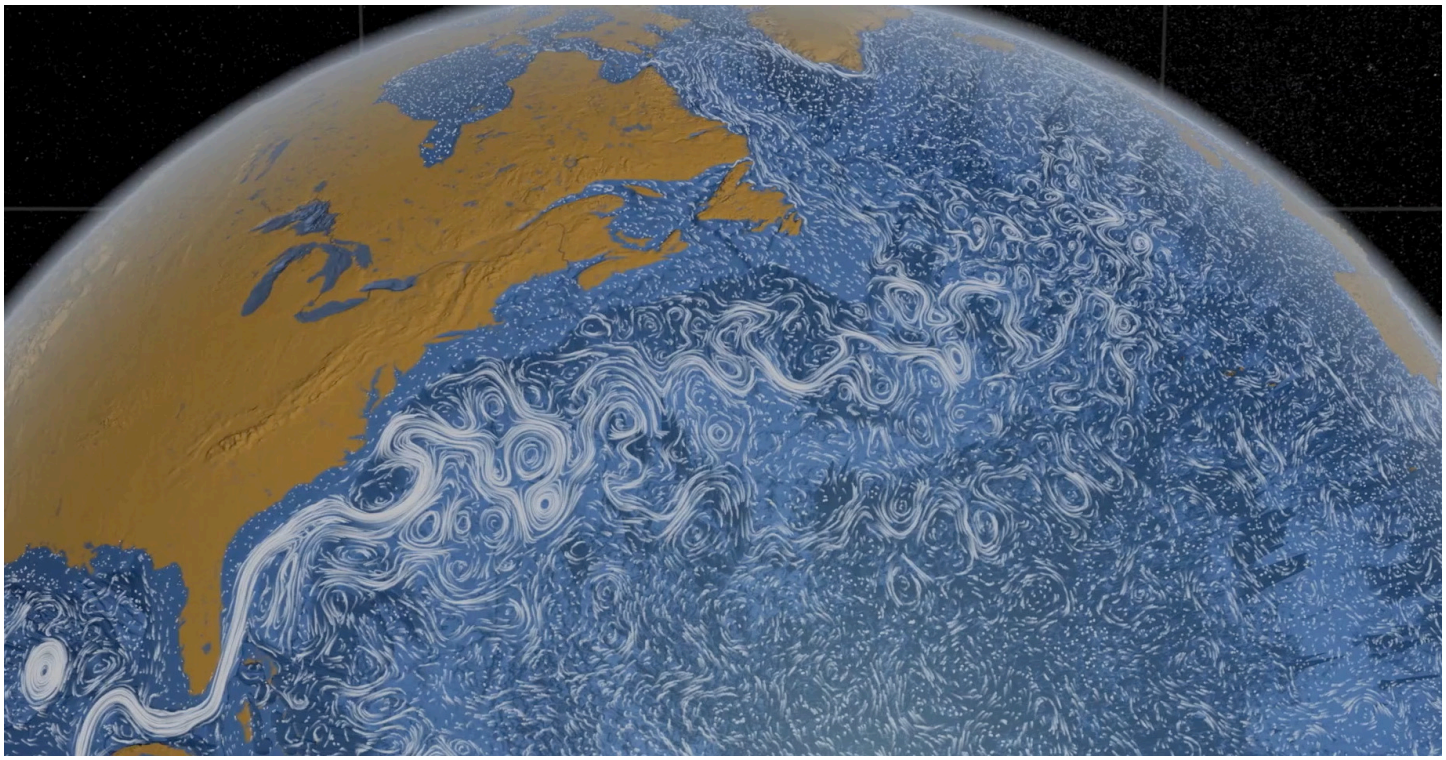
My NASA Data - Lesson Plans

Ocean Circulation Patterns: Garbage Patches Story Map



Overview

Using various visualizations (i.e., images, charts, and graphs), students will explore ocean circulation patterns as they relate to the world's ocean garbage patches using NASA ocean currents data. Students will investigate the forces that contribute to ocean circulation patterns, and how debris, especially plastics, travel from land to garbage patches. Students will also analyze regional plastic production and waste management data to describe how humans have contributed to ocean plastic pollution. This story map is intended to be used with students who have access to a computing device in a 1:1 or 1:2 setting.

CLICK HERE

Learning Objectives

- Students will analyze and compare multiple variables of the Earth System as they analyze ocean circulation patterns.
- Students will investigate the relationship between ocean circulation patterns and garbage patches.
- Students will investigate the forces that contribute to ocean circulation patterns.
- Students will model their understanding of the Earth System interactions that contribute plastics on land to ocean garbage patches.

Why Does NASA Study This Phenomenon?

Part of NASA's mission is to develop an understanding of the total Earth System and the effects of natural and human-induced changes on the global environment. Collecting and analyzing long-term ocean data from satellites is a relatively new field of exploration. The analysis of remotely-sensed ocean data makes it possible to understand the ocean in new and exciting ways. Remotely sensed satellite data and modeling techniques enable the global mapping of seasonal changes in ocean surface topography, currents, waves, winds, phytoplankton content, sea-ice extent, rainfall, sunlight reaching the sea, and sea surface temperature.

Essential Questions

1. What are garbage patches and how are they formed?
2. What forces within the Earth System contribute to ocean circulation patterns?
3. What conditions within the Earth System allow plastic on land to be transported to ocean garbage patches?

Cross-Curricular Connections

National Geography Standards:

- How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Materials Required

Resources Needed Per Student:

- Student Data Sheet - Link

Resources Needed Per Group:

- Computer/Tablet
- Internet Access
- Link to the *"Ocean Circulation Patterns: Garbage Patches"* Story Map - Link

Technology Requirements

- Internet Required
- One-to-a-Group

Teacher Background Information

Ocean currents are masses of water in motion that circulate the water and all that's in it. Driven by wind and other forces, currents on the ocean surface cover our planet. Some span hundreds to thousands of miles across vast ocean basins in well-defined flows. Others are confined to particular regions and form slow-moving, circular pools. Seen from space, the circulating waters offer a study in both chaos and order.

To learn more, visit:

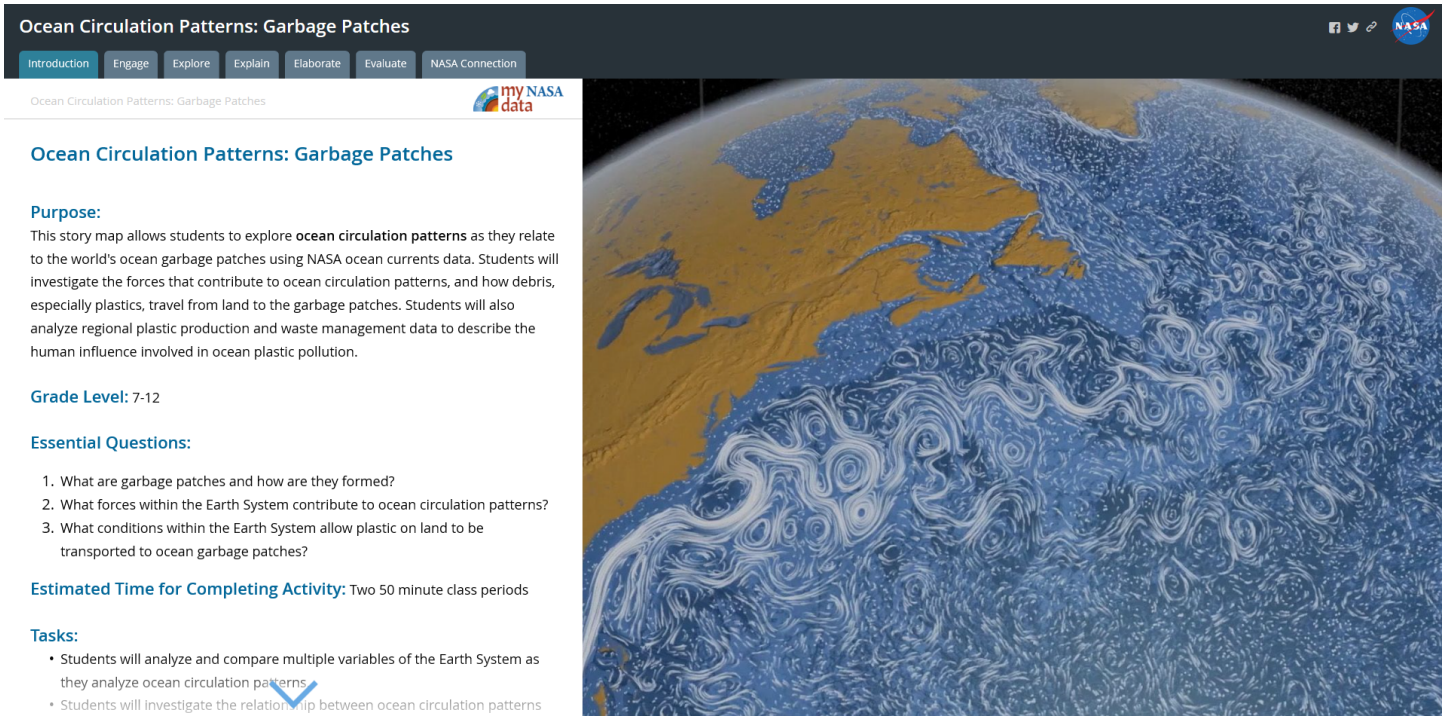
- The MND Ocean Circulation Phenomena page for background information
- The Explain tab found in the Story Map

Prerequisites Student Knowledge

- Familiarity with finding coordinates on a map
- Familiarity with line plots and bar graphs

Procedure

Visit the Story Map to access the 5 E Lesson.



Teacher Answer Key

Teachers who are interested in receiving the answer key, please contact My NASA Data from your school email address at larc-mynasadata@mail.nasa.gov.

Extensions


If your students need additional practice with data analysis, consider incorporating this story map with the My NASA Data Data Literacy Cubes.